

ANNUAL REPORT  
for  
OPERATION OF WASTEWATER TREATMENT PLANTS  
ADVANCED WASTE TREATMENT  
INDUSTRIAL WASTE TREATMENT  
TREATMENT OF METAL WASTESTREAMS  
PRETREATMENT FACILITY INSPECTION  
OPERATION AND MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS  
WATER TREATMENT PLANT OPERATION  
SMALL WATER SYSTEM OPERATION AND MAINTENANCE  
WATER DISTRIBUTION SYSTEM OPERATION AND MAINTENANCE

<u>Summary</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>Totals 1972-Date</u>
Manuals Sold	18,151	27,153	36,001	186,750
Students Enrolled	4,859	6,350	7,113	41,179
Students Completing	2,606	4,662	7,024	34,282
Students Dropped	416	687	656	7,464
University Credit	231	169	139	4,033

Administered and Monitored by  
HORNET FOUNDATION OF CALIFORNIA STATE UNIVERSITY, SACRAMENTO  
and  
DEPARTMENT OF CIVIL ENGINEERING  
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For the  
U. S. ENVIRONMENTAL PROTECTION AGENCY

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The purpose of this report is to provide a summary of the accomplishments of each program on an annual basis since its inception. All programs are operating on a financially self-sustaining basis.

**OPERATION OF WASTEWATER TREATMENT PLANTS (First Edition)**

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-12</u>
1972	8063	571	128	82	614
1973	5747	1569	1490	51	389
1974	6523	1144	1717	40	289
1975	4543	804	655	55	164
1976	3992	676	1052	39	119
1977	3280	570	248	70	166
1978	3232	789	310	72	141
1979	3180	881	191	82	103
1980	2444	745	431	63	109
<u>1981</u>	<u>1093</u>	<u>1028</u>	<u>239</u>	<u>81</u>	<u>55</u>
TOTALS:	41,100	8777	4124*	68	2149

Colleges and Universities: 301  
Foreign Countries: 32

\*From 1979 on only persons who actually started course and did not finish were counted as drops.

### WATER SUPPLY SYSTEM OPERATION

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-17</u>
1983	537	0	0		3
1984	1526	140	0	100	13
1985	1957	146	22	87	39
1986	1814	148	50	75	5
1987	399	290	71	80	10
TOTALS:	6233	724	143	84	70

Colleges and Universities: 59  
Foreign Countries: 9

In 1987 WATER SUPPLY SYSTEM OPERATION was revised and split into two manuals, SMALL WATER SYSTEM OPERATION AND MAINTENANCE and WATER DISTRIBUTION SYSTEM OPERATION AND MAINTENANCE .

### SMALL WATER SYSTEM OPERATION AND MAINTENANCE

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-19</u>
1987	2175	36	0	100	2
1988	2115	177	9	95	5
	—	—	—	—	—
TOTAL:	4290	213	9	96	7

Colleges and Universities: 50  
Foreign Countries: 4

### WATER DISTRIBUTION SYSTEM OPERATION AND MAINTENANCE

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-20</u>
1987	2864	42	0	100	0
1988	2812	226	12	95	9
	—	—	—	—	—
TOTAL:	5676	268	12	96	9

Colleges and Universities: 63  
Foreign Countries: 2

## WATER TREATMENT PLANT OPERATION

### VOLUME I

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-18</u>
1983	1469	31	0	100	10
1984	2068	327	27	92	116
1985	2344	355	82	81	69
1986	2391	415	108	79	35
1987	2972	557	143	80	29
1988	3898	900	159	85	20
	—	—	—	—	—
TOTALS:	15,142	2585	519	83	279

### VOLUME II

1983	183	0	0		1
1984	1331	140	0	100	9
1985	1572	133	7	95	19
1986	1467	163	21	89	6
1987	1916	322	13	96	12
1988	2301	371	23	94	9
	—	—	—	—	—
TOTALS:	8770	1129	64	95	56

Colleges and Universities: 135

Foreign Countries: 18

**OPERATION AND MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS (First Edition)**

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-11</u>
1976	966	3			7
1977	1093	281	8	97	77
1978	759	246	70	78	46
1979	633	179	83	68	34
1980	645	226	53	81	37
1981	680	218	37	85	46
<u>1982</u>	<u>601</u>	<u>265</u>	<u>42</u>	<u>86</u>	<u>23</u>
TOTALS:	5377	1418	292	83	263

**SECOND EDITION**

1983	583	25	0	100	3
1984	751	97	10	91	10
1985	1103	147	16	90	13
1986	1237	157	31	84	13
1987	1108	329	90	79	9
1988	0	121	33	79	4
TOTALS:	4782	876	180	83	52

In 1987 the Second Edition was revised and split into two Volumes.

**VOLUME I**

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-11A</u>
1987	546	2	0	100	0
1988	1803	189	0	100	3
TOTALS:	2349	191	0	100	3

**VOLUME II**

1987	338	0	0	0	0
1988	1413	65	0	100	1
TOTALS:	1751	65	0	100	1

Colleges and Universities: 82

### TREATMENT OF METAL WASTESTREAMS

(Formerly TREATMENT OF WASTEWATER FROM ELECTROPLATING, METAL FINISHING AND PRINTED CIRCUIT BOARD MANUFACTURING)

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-12D</u>
1986	1281	98	0	100	18
1987	1678	317	9	98	25
1988	2077	369	24	94	13
	—	—	—	—	—
TOTAL:	5036	784	33	96	56

Colleges and Universities: 54  
Foreign Countries: 14

**GRAND TOTAL:**  
91,153                      17,988                      2,121                      89                      1,144

### PRETREATMENT FACILITY INSPECTION

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-12G</u>
1988	1355	48	0	100	0

Colleges and Universities: 12  
Foreign Countries: 1

### ADVANCED WASTE TREATMENT

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-12E</u>
1987	960	7	0	100	0
1988	3199	476	1	100	7
	—	—	—	—	—
TOTAL:	4159	483	1	100	7

Colleges & Universities: 66  
Foreign Countries: 2

### INDUSTRIAL WASTE TREATMENT

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CF-12F</u>
1987	941	3	0	100	0
1988	2273	387	1	100	5
	—	—	—	—	—
TOTAL:	3214	390	1	100	5

Colleges & Universities: 53  
Foreign Countries: 2

**OPERATION OF WASTEWATER TREATMENT PLANTS, (Second Edition)**

**VOLUME I**

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completing</u>	<u>CFX-12 A, B, C</u>
1980	1190				19
1981	3960	411	8	98	127
1982	3976	731	181	80	98
1983	2963	655	184	78	76
1984	3347	2087	171	92	66
1985	4064	862	267	76	59
1986	4534	896	155	85	82
1987	5360	1498	262	85	47
1988	<u>7591</u>	<u>2331</u>	<u>326</u>	<u>88</u>	<u>37</u>
TOTAL:	36,985	9471	1554	86	611

**VOLUME II**

1980	715				4
1981	3023	182			47
1982	3575	309	18	94	45
1983	2438	381	33	92	39
1984	2219	872	35	96	29
1985	2827	454	91	83	25
1986	3161	438	21	95	43
1987	4134	937	72	93	20
1988	<u>6386</u>	<u>1084</u>	<u>49</u>	<u>96</u>	<u>22</u>
TOTAL:	28,478	4657	319	94	274

**VOLUME III**

1980	428				1
1981	2422	140			58
1982	1898	213	35	86	25
1983	1437	217	33	87	30
1984	1537	430	24	95	12
1985	1525	310	45	87	17
1986	2266	291	30	91	29
1987	1762	322	27	92	15
1988	<u>6</u>	<u>280</u>	<u>19</u>	<u>94</u>	<u>4</u>
TOTAL:	13,281	2203	213	91	191

Colleges and Universities: 252  
 Foreign Countries: 16

In 1987 Volume III was revised and split into two manuals, ADVANCED WASTE TREATMENT and INDUSTRIAL WASTE TREATMENT.